

REMARKS

Reconsideration is respectfully requested. Proposed amendments to claims 32, 38, 77, 81, 152-153 and 156-157 have been Presented. If this amendment is entered, claims will be pending 32-34, 36-38, 40-43, 77, 79-81, 83-86, 118-119, 134-135, 138-139, and 150-157 will be pending.

Telephonic Interview

The applicants thank Examiners Juliet Switzer and Jeff Fredman for the helpful interview on September 4, 2003. The discussion of van Ooijen in the context of the § 103 rejection was quite useful. The present response follows the results of that discussion.

Notice of Appeal

A notice of appeal has been submitted with this response.

Claim Rejections – 35 U.S.C. § 103

A. The Examiner's Rejections

The Examiner has rejected claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 113, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 133, 134, 136, 138, 140, 142, 144, 146, and 148 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Ishiwatari *et al.* (Planta, 1995, 195(3):456-463):, and optionally, both of these further in view of Shi *et al.* (Plant Molecular Biology, 1996, 32:653-662):.

The Examiner has further rejected claims 32, 33, 34, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 119, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 139, 140, 142, 144, 146, and 148 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in

view of Gautier *et al.* (European Journal of Biochemistry, 1998, 252:314-324):, and optionally, both of these further in view of Shi *et al.*

The Examiner has further rejected claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, and 152 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Rivera-Madrid *et al.* (PNAS USA, 1995, 92:5620-5624):, and optionally, both of these further in view of Shi *et al.*

The Examiner has further rejected claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 151, and 153 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Shi *et al.*

The Examiner has further rejected claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 154, and 156 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Brugidou *et al.* (Mol. Gen. Genet., 1993, 238:285-293):, and optionally, both of these further in view of Shi *et al.*

The Examiner has further rejected claims 32, 33, 34, 35, 39, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 11, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 155, and 157 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Bower *et al.* (The Plant Cell, Vol. 8:1641-1650):, and optionally, both of these further in view of Shi *et al.*

The Examiner has further rejected claims 36-37 and 79-80 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Ishiwatari *et al.* (Planta, 1995, 195(3):456-463):, and optionally, both of these further in view of Shi *et al.* (Plant Molecular Biology, 1996, 32:653-662): as applied to claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 113, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 133, 134, 136, 138, 140,

142, 144, 146, and 148 above, and further in view of Marris *et al.* (Plant Molecular Biology, 1988, 10:359-366):.

The Examiner has further rejected claims 36-37 and 79-80 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Gautier *et al.* (European Journal of Biochemistry, 1998, 252:314-324):, and optionally, both of these further in view of Shi *et al.* as applied to claims 32, 33, 34, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 119, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 139, 140, 142, 144, 146, and 148 above, and further in view of Marris *et al.*

The Examiner has further rejected claims 36-37 and 79-80 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Rivera-Madrid *et al.* (PNAS USA, 1995, 92:5620-5624):, and optionally, both of these further in view of Shi *et al.* as applied to claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, and 152 above, and further in view of Marris *et al.*

The Examiner has further rejected claims 36-37 and 79-80 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Shi *et al.* as applied to claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 151, and 153 above, and further in view of Marris *et al.*

The Examiner has further rejected claims 36-37 and 79-80 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Brugidou *et al.* (Mol. Gen. Genet., 1993, 238:285-293):, and optionally, both of these further in view of Shi *et al.* as applied to claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 154, and 156 above, and further in view of Marris *et al.*

The Examiner has further rejected claims 36-37 and 79-80 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Bower *et al.* (The Plant Cell, Vol.

8:1641-1650);, and optionally, both of these further in view of Shi *et al.* as applied to claims 32, 33, 34, 35, 39, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 11, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 155, and 157 above, and further in view of Marris *et al.*

The Examiner has further rejected claims 36, 37, 43, 79, 80, and 86 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Ishiwatari *et al.* (Planta, 1995, 195(3):456-463);, and optionally, both of these further in view of Shi *et al.* (Plant Molecular Biology, 1996, 32:653-662): as applied to claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 113, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 133, 134, 136, 138, 140, 142, 144, 146, and 148 above, and further in view of Brandt *et al.* (Plant Molecular Biology, 1988, 10:359-366);.

The Examiner has further rejected claims 36, 37, 43, 79, 80, and 86 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Gautier *et al.* (European Journal of Biochemistry, 1998, 252:314-324);, and optionally, both of these further in view of Shi *et al.* as applied to claims 32, 33, 34, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 119, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 139, 140, 142, 144, 146, and 148 above, and further in view of Brandt *et al.*

The Examiner has further rejected claims 36, 37, 43, 79, 80, and 86 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Rivera-Madrid *et al.* (PNAS USA, 1995, 92:5620-5624);, and optionally, both of these further in view of Shi *et al.* as applied to claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, and 152 above, and further in view of Brandt *et al.*

The Examiner has further rejected claims 36, 37, 43, 79, 80, and 86 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Shi *et al.* as applied to claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 118, 120, 122,

124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 151, and 153 above, and further in view of Brandt *et al.*

The Examiner has further rejected claims 36, 37, 43, 79, 80, and 86 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Brugidou *et al.* (Mol. Gen. Genet., 1993, 238:285-293):, and optionally, both of these further in view of Shi *et al.* as applied to claims 32, 33, 34, 35, 38, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 154, and 156 above, and further in view of Brandt *et al.*

The Examiner has further rejected claims 36, 37, 43, 79, 80, and 86 under 35 U.S.C. 103 as being unpatentable over van Ooijen *et al.* (US 5543576): in view of Bower *et al.* (The Plant Cell, Vol. 8:1641-1650):, and optionally, both of these further in view of Shi *et al.* as applied to claims 32, 33, 34, 35, 39, 39, 40, 41, 42, 77, 81, 82, 83, 84, 85, 112, 11, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 155, and 157 above, and further in view of Brandt *et al.*

G. Van Ooijen *et al.* (US 5543576): in view of Ishiwatari *et al.* and optionally, both of these further in view of Shi *et al.* and further in view of Marris *et al.*

H. Van Ooijen *et al.* (US 5543576): in view of Gautier *et al.* and optionally, both of these further in view of Shi *et al.* and further in view of Marris *et al.*

I. Van Ooijen *et al.* (US 5543576): in view of Rivera-Madrid *et al.* and optionally, both of these further in view of Shi *et al.* and further in view of Marris *et al.*

J. Van Ooijen *et al.* (US 5543576): in view of Shi *et al.* and further in view of Marris *et al.*

K. Van Ooijen *et al.* (US 5543576): in view of Brugidou *et al.* and optionally, both of these further in view of Shi *et al.* and further in view of Marris *et al.*

L. Van Ooijen *et al.* (US 5543576): in view of Bower *et al.* and optionally, both of these further in view of Shi *et al.* and further in view of Marris *et al.*

M. Van Ooijen et al. (US 5543576): in view of Ishiwatari et al. and optionally, both of these further in view of Shi et al. and further in view of Brandt et al.

N. Van Ooijen et al. (US 5543576): in view of Gautier et al. and optionally, both of these further in view of Shi et al. and further in view of Brandt et al.

O. Van Ooijen et al. (US 5543576): in view of Rivera-Madrid et al. and optionally, both of these further in view of Shi et al. and further in view of Brandt et al.

P. Van Ooijen et al. (US 5543576): in view of Shi et al. and further in view of Brandt et al.

Q. Van Ooijen et al. (US 5543576): in view of Brugidou et al. and optionally, both of these further in view of Shi et al. and further in view of Brandt et al.

R. Van Ooijen et al. (US 5543576): in view of Bower et al. and optionally, both of these further in view of Shi et al. and further in view of Brandt et al.

B. Unexpected results

Applicants respectfully disagree with the Examiner's grounds for rejection. However, in order to facilitate prosecution in this case applicants have Amended the pending claims, without prejudice or disclaimer, to recite a plant selected from the group consisting of barley or wheat. With the amendment, the claims are not obvious in light of the unexpected results obtained with transgenic wheat and barley.

Applicant submits that the obviousness rejection is fully rebutted by the results of the present specification which show, unexpectedly, the expression of thioredoxin in transgenic monocots. The specification provides evidence of unexpected results with regard to barley plants expressing wheat thioredoxin h and wheat plants transformed with wheat thioredoxin h. The specification demonstrates the unexpected result that barley expressing wheat thioredoxin h have increased activity of alpha amylase and pullulanase in the seeds. (See Example 1 at page 39 and 40):. Furthermore, seeds from these transgenic barley plants germinate earlier than plants without the transgene. (See Example 1 at page 40).

The specification demonstrates that wheat plants overexpressing wheat thioredoxin h, unexpectedly, have increased digestibility and reduced allergenicity. (See Example 3 at page 51 and Example 5 at pages 52-53, respectively). For the avoidance of doubt, Example 3 clearly indicates that the tests were performed on transgenic grain (YRHptWTR-1-1), which is transgenic for thioredoxin h and does not have the *Arabidopsis* NTR. Table 8 on page 50 indicated that YRHptWTR-1): was transformed with pKBhssWTRXhN3-8, which as described on page 45, lines 18-33, contains thioredoxin h and not NTR. The *Arabidopsis* NTR construct is pDhAtNTR-4, as described on page 46, lines 6-16. The construct was transformed into a different strain as indicated on Table 8. Thus, the unexpected results with both wheat and barley occur with thioredoxin h alone and do not require NTR. Furthermore, thioredoxins h from different species are interchangeable as a redox reagents and therefore, one of ordinary skill in the art would expect that thioredoxins from barley, rice, *Arabidopsis*, soybean, tobacco and Brassica would provide the same results as the wheat thioredoxin h. Thus, the obviousness rejection is fully rebutted over the entire scope of the claims

Applicants therefore respectfully request that the Examiner withdraw the obviousness rejection.

CONCLUSION

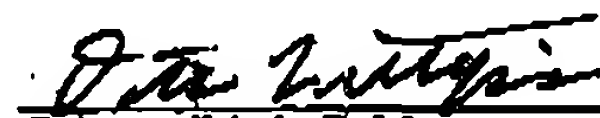
In light of the above amendments and remarks, applicants submit that the pending claims are in condition for allowance. Should there be any remaining issues that remain unresolved, the Examiner is encouraged to contact the undersigned by telephone.

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 416272001300. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Respectfully submitted,

Dated: October 28, 2003

By:


Otis B. Littlefield
Registration No. 48,751

Morrison & Foerster LLP
425 Market Street
San Francisco, California 94105-2482
Telephone: (415): 268-6846
Facsimile: (415): 268-7522

RECEIVED
CENTRAL FAX CENTER

OCT 28 2003

OFFICIAL